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III. *Microscopical Observations on the Seeds of several East-India Plants, by Mr Anthony van Leeuwenhoek, F. R. S.*

Delft in Holland, March 19. 1706.

To the Honourable the Members of the
Royal Society in London.

Honourable Gentlemen,

I Now take the Liberty of communicating to you these my following Observations——A certain ancient Surgeon, that is a great Collector of Foreign Curiosities, had entreated another Surgeon, for whom he had an esteem, that when he was in the *East Indies*, and discover'd in the Plants or Seeds of those Parts any particular operation or effect, that he would impart some of 'em to him, with an account of their said operation ; whereupon he had received from the *East Indies* the Seed of a Tree called *Emmane*, of which the Description and Operation is as follows——'Tis a Tree much about the bigness of an Elder Tree, and the Flower, the Scent and Figure of it is not very different, but the Branches are armed with Thorns——'Tis used inwardly by no body, excepting some Women, that, disagreeing with their Husbands, make use of it in order to kill themselves; it being consequently a certain Poyson ——When these Women have made such a Heathenish and Impious Resolution, they take half a handful of those Leaves, boyling
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them in Water, and rubbing in a certain Oyl which they call *Sinfelen*, and so drink or eat it up; half an hour after which they perceive a kind of Convulsion in their Head, and vomit or retch four or five times: Lastly, they lose their Sences, and foaming at the Mouth, they fret and speak like Fools or Mad men till they dye: So that it seems that the Poyson thickens the Humours or fluid parts of the Body, till the circulation of them quite ceases. Some end their lives in one, others in two or three days, according as they have taken more or less of those Leafs. So far proceeded the Description that the *East India* Surgeon gave of it——The abovemention'd Seed is mostly of a Triangular figure, and not above the breadth of $\frac{1}{2}$ of an inch where it is largest; I took a little of it and put into a clean Paper and bruised it with a Hammer, and after that into a little Glasse Viol, and poured some fair Rain Water upon it, till the Water stood half an inch above the Seed——After the Seed had been infused in the said Water some hours, I took a little of the Water and mixed it with my Blood, as it dropt from my Finger by the pricking of a Needle, and I immediately observed that the Blood was extreamly Coagulated, yea, more than I had ever seen it in my Life——But as Blood, when 'tis mixed with common Water, keeps its clear Red Colour, and a great many Globules, which are the cause of its redness, being dissolved in the Water, do so incorporate themselves therewith that you can distinguish none of them from the Water itself, which thereby acquires a fine Crimson Colour; the appearance was quite otherwise with the Blood that was mixed with the Seed Water, for the Particles or Globules thereof being Coagulated, did assume a Blackish or Dirty Colour: and so I observed a very great number of Blood Globules that were not Coagulated, they all lay like stiff Particles; neither could I perceive that one of them were dissolved, or united to the Water: so that not the least

redness that looked like Blood was communicated to the Water, neither did there break forth the least Air bubble out of that mingled Liquor——I took moreover a little of the said Water, that was inclinable to a reddish colour, and dropt some of it upon six several places on a Glass Plate, in order to observe what Salt Particles might be Coagulated in the exhaled Liquor——I observed in the said Liquor, most of which did evaporate, that besides the Salt Particles there remain'd a great deal of a Coagulated Matter, in which I could discover no figure. I perceived likewise abundance of exceeding small Salt Particles, which were mostly of an exact square figure, and some few were long squares, with four Right Angles; some of those Salt Particles were broad in the middle, and pointed at both ends; but where a great many of them were Coagulated together, their figures were irregular——I observed likewise, that where the Water had lain a little time together, it was not altogether exhaled, but left a Balsamous Matter behind it——I put some of the said Seed into Water, in order to soften the Skin of it, that I might Dissect it the easier; and having accordingly open'd several of them, I took out the Plant, in which, tho it was no bigger than a small grain of Sand, I could perceive two Leaves, and that part of it which was to be the Root and Body——It was moreover affirmed, that the Oyl of *Singelan* or *Singely*, is esteem'd a good softner, and given to lying-in Women, and other persons that are in pain, as also to Children, with or without other Ingredients.

The Seed, of which also I had a little, is about the bigness of the aforementioned Seed, but something longer——I had moreover some few Seeds named *Cansie*, of which this is the Description——This Seed is used by the *Mahometans*, being grownd small and infused in Water, which will make them as drunk as Wine does others: If a person that is not us'd to it should take but

10 or 20 grains, 'twould have the same effect as if they had drank 10 Bottles of Wine.

They say it makes them very stout and luxurious, but those that use it daily and too often, do bring themselves at last to 1 or 2 ounces; but then it will not have that effect, but rather the quite contrary, rendring them dull and doting, depriving them of their Memory together with the Appetite, and at last making them so lean, that they would have hardly any Flesh upon their Bones; and this is the use the *Moorish* Kings make of it, when they have a mind to be rid of their great Lords, whom they would make dye a lingering Death, they cause such a Drink to be made, into which they infuse also the Seeds of Poppies, and give it them twice a day to drink in the Prison, more or less, according as they have a mind to dispatch them sooner or later; insomuch that they shall live half a year or a whole year without knowing any thing of the matter. They call this Drink *Bosta*.

This Seed is little used by them in Physick, tho I doubt not that it might be excellently well apply'd; because it does not only imitate the effects of *Opium*, but also, if there be not too much of it us'd at a time, it has the same operation as the best Wine: So much for the Description of this Seed called *Cancie*.—— This Seed is about the bigness of Hempseed, and has likewise such a hard Skin, so that one would be apt to take it for it.—— I took some of the last mention'd Seeds and stripped the hard Skins from them, and after that the thin Membrane that covers the Plant, and observed that the Matter which lay within was, as it appeared to me, nothing else but two Leafs and the Root and Body of a Plant; but when I separated those two Leafs, I found that they involved two other very small Leafs, long and slender, and of the figure of the former; and I also discover'd that these small Leafs had each of them four or five small ones standing out above one another. From whence

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I concluded that the Tree or Plant which produces these Leaves is notched or indented——Afterwards I took some of the Hempseed, which I thought I had well Dissected, and of which, if my Memory fails me not, I have formerly given a Description to the Royal Society ; and examin'd the said Seed anew, to try whether I could discover any such small Leafs as I have found before in the Seed *Cancie*——Having then Dissected this our common Hempseed, I found that all the parts of it agreed with that of the abovemention'd Seed ; at first indeed when I took the small Leafs out of the larger in which they were folded, I could not see those Indented Parts abovemention'd, but when I separated the Leafs from each other, I could easily perceive them ; and then appear'd the two exceeding long Leafs lying so regularly within one another, that the Indented parts could not be discover'd——I bruised a few of these little *Cancie* Seeds, and pour'd Rain Water upon them, in order to discover whether there were any Salt Particles in the same, and tho I let some of the drops of this Water stand several days together, it did not at all evaporate, but there remain'd behind a thick moist Oily Matter, which I suppose was the cause that I could discover so few Salts to be Coagulated, and those that were there, that are hardly worth naming, were of the figure of those that are found in Wine Vinegar.